REMARKS

Claims 1-28 and 30-33 are pending in the present application. In the Final Office Action mailed September 13, 2007, the Examiner rejected claims 1-9 and 12-26 under 35 U.S.C. §102(e) as being anticipated by Larson et al. (US Pub. 2004/0155653) (hereinafter Larson). The Examiner next rejected claim 27 under 35 U.S.C. §103(a) as being unpatentable over Larson Claims 10, 11, and 33 are rejected under 35 U.S.C §103(a) as being unpatentable over Larson in view of Haacke et al. (Haacke et al., Magnetic Resonance Imaging, John Wiley and Sons, 1999) (hereinafter Haacke). Claims 28 and 30-32 are rejected under U.S.C §103(a) as being unpatentable over Larson in view of Ho et al. (US Pub. 2003/0216637) (hereinafter Ho).

The Examiner rejected claims 1, 5, and 15 under §102(e) as being anticipated by Larson. Applicant respectfully disagrees.

Larson does not teach, either expressly or inherently, the determination of motion in the region-of-interest directly from MR non-imaging data as set forth in claim 1. Rather than directly relying on non-spatially encoded MR non-imaging data, Larson relies either wholly on imaging data to extract timing information therefrom or "from a combination of MR imaging data and additional non-imaging data." *Larson,* ¶20. In neither teaching, however, is the determination of motion in the region-of-interest directly from MR non-imaging data. At best, a combination of imaging data and non-imaging data is used rather than using non-imaging data directly.

Further, Larson does not expressly or inherently teach the determination of motion directly from non-spatially encoded MR data. The Examiner inaccurately stated that non-spatially encoded MR data is equivalent to non-imaging MR data. *Office Action*, 09/13/2007, pg. 2 ("timing information may be extracted from non-imaging data [], which is equivalent to non-spatially encoded data …"). Substantially similar statements were made throughout the *Response to Arguments* section of the Office Action. *Office Action*, 09/13/2007, pg. 3-4. The Examiner's statement is incorrect. Contrary to the Examiner's assertion, non-imaging data is not all equivalent to non-spatially encoded data. Larson defines "imaging data" as "data that is used to produce MR images, and not to data that is acquired exclusively for other purposes, e.g., additional data acquired solely to provide timing information." *Larson*, ¶57. While non-imaging MR data may refer to data that is not used to produce an MR image; it does not mean in and of itself that the data is non-spatially encoded. *See Larson, ¶40.* Non-imaging data may be spatially encoded. Larson contains a classic example of spatially encoded non-imaging data. Larson discloses that "a technique known as navigator gating or navigator echo derives a timing signal from extra, non-imaging data." *Larson*, ¶9. A navigator echo is used to acquire spatially-

encoded projection data to derive a timing signal and is not used in the final MR image. That is, as seen in the Larson example, spatially-encoded MR non-imaging data is used for timing purposes and is not used in the final image.

Accordingly, Larson does not teach, disclose, or suggest the determination of "motion in the region-of-interest directly from non-spatially-encoded MR non-imaging data" as set forth in claim 1. As such, Applicant respectfully requests withdrawal of the §102(e) rejection of claim 1, and all claims depending therefrom.

The Examiner has rejected claim 5 under §102(e) as being anticipated by Larson. Larson does not expressly or inherently teach carrying out "slice tracking," as set forth in claim 5. The Examiner has stated that Applicant's slice tracking is conceptually equivalent to Larson's timing. *Office Action,* 08/13/2007, pg. 2, no. 10. Applicant respectfully disagrees. Synchronization (timing) and slice tracking are very different concepts. Synchronization, or timing determination, determines when a motion occurs. Tracking, on the other hand, spatially determines the motion. In other words, tracking relates to space, whereas timing/synchronization refers to time. These are two very different concepts. Larson, is directed to synchronization of MR images to motion, obtained by extracting timing information. *Larson*, Abstract. Claim 5, however, is directed towards slice tracking, which spatially determines motion.

Accordingly, that which is called for in claim 5 is not expressly or inherently taught by the art of record. As such, Applicant respectfully requests the withdrawal of the §102(e) rejection to claim 5.

The Examiner rejected claim 15 under §102(e) as being anticipated by Larson. Applicant respectfully disagrees. Larson does not teach each and every element of claim 15, either expressly or inherently.

Larson does not teach, disclose, or suggest the sampling of MR data "prior to spatially encoding gradients" as set forth in claim 15. In contrast to claim 15, Larson teaches the extraction of timing information from imaging data. *Larson,* ¶35. That is, Larson teaches the extraction of MR data during the application of spatial encoding gradients: imaging and/or non-imaging. *See id at* ¶43 (using a "2-dimensional image from which timing information can be extracted").

Accordingly, that which is called for in claim 15 is not expressly or impliedly taught by the art of record. Applicant, therefore, respectfully requests withdrawal of the §102(e) rejection of claim 15, and all claims depending therefrom.

The Examiner rejected claim 28 under §103(a) as being unpatentable over Larson in view of Ho. Ho was published on November 20, 2003. The present application was filed on October 12, 2004. Since the publication date of Ho is less than one year before the filing date of the present application, Ho qualifies as prior art under 35 U.S.C. §102(e). However, since the present application and Ho were, at the time the invention was made, owned by and/or subject to an obligation of assignment to the same entity, Ho cannot be cited in a rejection against the claimed invention under 35 U.S.C. §103(a). See MPEP §706.02(l). The Ho application was assigned to GENERAL ELECTRIC COMPANY and recorded at Reel/Frame #016212/0534. The current application is also assigned to GENERAL ELECTRIC COMPANY and recorded at Reel/Frame #015570/0231.

Further, Applicant would like to point out that the Examiner has made inaccurate, unsupported, and unsubstantiated statements with regard to the §103(a) rejection of claim 28. In regard to claim 28, the Examiner stated that "[t]he relative timing during the time interval when k-space origin data are acquired (whether before or after further spatial encoding gradients are applied) has no bearing on its motion compensation purpose. . . ." *Office Action*, 09/13/2007, pg. 13. The Examiner has proffered no support or substantiation for this statement. Applicant believes that one skilled in the art would not agree with the Examiner that relative timing during the time interval when k-space origin data are acquired has no bearing on its motion compensation purpose. Applicant requests that if the Examiner maintains the assertion of the above statement, that the Examiner show some sort of evidence in support of such.

In addition, Larson does not teach, disclose, or suggest the acquisition of MR data prior to application of spatial encoding gradients as called for in claim 28. In contrast to claim 28, Larson repeatedly discloses using spatially encoded MR imaging data for timing purposes. That is, Larson acquires MR data during the application of spatial encoding gradients. Further, when Larson does discuss using non-imaging data, such data is spatially encoded. *Larson*, ¶¶39-44.

Accordingly, for at least the reasons given above, Applicant requests withdrawal of the §103(a) rejection of claim 28, an all claims depending therefrom.

The Examiner rejected claim 33 under §103(a) as being unpatentable over Larson in view of Haacke. Applicant respectfully disagrees.

The Examiner stated that Larson discloses the use of non-imaging data; therefore, according to the Examiner, Larson discloses the use of non-spatially encoded data. *Larson*, 09/13/2007, pg. 11. Applicant does not disagree that Larson discloses the use of non-imaging data. However, as discussed above, non-spatially encoded data is not necessarily equivalent to

non-imaging data. As such, Larson does not teach, disclose, or suggest acquiring non-spatially-encoded MR data, as set forth in claim 33.

Similar to claim 28, the Examiner stated that "the relative timing during the repetition time interval when k-space origin data are acquired . . . has little bearing on its motion compensation purpose. . . ." *Office Action, 09/13/07*, pg. 12. As explained above, Applicant believes that one skilled in the art would not agree with the Examiner that relative timing during the time interval when k-space origin data are acquired has little bearing on its motion compensation purpose. Applicant requests that if the Examiner maintains the assertion of the above statement, that the Examiner show some sort of evidence in support of such.

Accordingly, that which is called for in claim 33 is not taught, suggested, or disclosed by the art of record. Applicant, therefore respectfully requests the withdrawal of the §103(a) to claim 33.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1-28 and 30-33.

Applicant appreciates the Examiner's consideration of these Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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General Authorization and Extension of Time

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 07-0845. Should no proper payment be enclosed herewith, as by credit card authorization being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 07-0845. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extensions under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 07-0845. Please consider this a general authorization to charge any fee that is due in this case, if not otherwise timely paid, to Deposit Account No. 07-0845.

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